UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/782,495	02/13/2001	Lorraine M. Herger	YOR920000505US1(13841)	9923

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EXAMINER
BATAILLE, PIERRE MICHE

ART UNIT	PAPER NUMBER
2186	

DATE MAILED: 09/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	09/782,495	HERGER ET AL.
	Examiner	Art Unit	
	Pierre-Michel Bataille	2186	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _29 June 2004_.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
   closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-30_ is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-4,6-8,15-19,21-23 and 28-30_ is/are rejected.

7)☒ Claim(s) _5,9-14,20, 24-27, and 29-30_ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a)☐ All   b)☐ Some * c)☐ None of:

   1.☐ Certified copies of the priority documents have been received.

   2.☐ Certified copies of the priority documents have been received in Application No. _____.

   3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
       application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
   Paper No(s)/Mail Date _____.
4)☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____.
5)☐ Notice of Informal Patent Application (PTO-152)
6)☐ Other: _____.

DETAILED ACTION

Response to Amendment

1.   This Office Action is taken in response to application's communication filed June

29, 2004. Claims 1-30 are now pending in the application.

Response to Arguments

2.   Applicant's arguments filed June 29, 2004 have been fully considered but they

are not deemed to be persuasive for at least the remarks below.

The March 30, 2004 Office Action correctly indicated that Relph does not teach

memory usage in a computer system that is transparent to the operating system kernel,

however, provided the Moore's reference (US 6,564,305) as teaching memory

compression in a computer device that is transparent to the operating system software.

Applicant argued that in Moore's system, the operating system is well aware of

the compression and is involved. However, this concept is exactly what Moore solved in

the invention. Moore states in the background of related art: **"The compression in**

prior devices is usually performed by the application programs that execute in

the devices. Unfortunately, the implementation of compression at the application

level usually greatly increases the cost of application development and may

decrease stability of application execution." (Col. 1, Lines 32-36)

Moore continues to add: **"A device is disclosed with compressing memory**

management for effectively increasing the size of its physical memory while

insulating applications from the underlying memory compression." ... **"The**

device includes mechanisms for transferring the information between the
compressed and uncompressed domains in a manner that is transparent to
applications and other software elements executing in the device". (Col. 1, Lines
46-50)

While the application suggests when reading the above passage that "the control
program and O/S in Moore is modified to become aware that there is compressed
memory", Moore clearly discloses *"transferring information between compressed and
uncompressed domains in a manner that is transparent to applications and other
software elements executing in the device"*.

The applicant argued that Moore, at Col. 3, Lines 36-52, specifically talks about
memory control being wholly within the domain of the operating system. To the contrary,
it is respectfully stated that such assertion is wrong as the section cited features nothing
of the sort. However, Moore reemphasizes at lines 53-60 of the same cited column:
***"These mechanisms for transferring information between the compressed and
uncompressed domains function in a manner that is transparent to software
elements such as application programs that are implemented in the device 10.
Application programs, for example, execute without regard to the underlying
address translations performed by the page manager and the compression
performed on the hardware path between the compressed and uncompressed
domains."***

In view of the above remarks, the rejection pertaining to claims 1-4, 6-8, 15-19,
21-23, and 28, is maintained and repeated below.

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in

section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are

such that the subject matter as a whole would have been obvious at the time the invention was made to a

person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived

by the manner in which the invention was made.

4.   Claims 1-4, 6-8, 15-19, 21-23, and 28 are rejected under 35 U.S.C. 103(a) as

being unpatentable over US 6,092,171 (Relph) in view of US 6,564,305 (Moore).

With respect to claims, 1 and 16, Relph teaches a device and method for

managing real memory in a computer system having an operating system and a

compressed main memory defining physical memory and a real memory characterized

as an amount of main memory as been by a processor, and including a compressed

memory hardware controller device for controlling processor access to said compressed

main memory (system including a processing circuit which receives data from the host,

a memory device which stores data and comprises a plurality of storage locations, and

a memory management unit for controlling the storage of data in the memory device)

[Abstract; Fig. 3A; Col. 2, Lines 54-63; Col 4, Lines 29-38], comprising: compressed

memory device driver for receiving real memory usage information from said

compressed memory hardware controller, said information including characterization of

said real memory usage state (a compression program for effecting compressed

storage of data in memory) [Col. 2, Lines 63-65; Col. 4, Lines 25-32]: compression

management subsystem for monitoring said memory usage and initiating memory

allocation and memory recovery in accordance with said memory usage state, said

subsystem including mechanism for adjusting usage threshold for controlling memory

state changes (the memory management unit determining when the amount of data

stored in one particular subset of the ordered array of subsets exceeds a predetermined

threshold) [Col. 2, Lines 65-67; Col. 4, Lines 37-42; Col. 7, Lines 60-67]. Relph

additionally teaches memory management unit determining whether the virtual address

corresponds to a physical address without software assistance or additional information

[Col. 10, Line 17-20]; but fails to specify that memory usage in said computer system is

transparent to said operating system. However, Moore teaches compression

management in a device wherein memory usage in said computer system is transparent

to said operating system [abstract; Col. 1, Lines 46-50]. Therefore, it would have been

obvious to one having ordinary skill in the art to come up with the claimed feature

because, as taught by Moore, the implementation of compression at the application

level would have increased the cost of application development and decreased stability

of application execution.

    With respect to claims 2 and 17, Relph teaches said controller hardware comprising

in interrupt generator for generating interrupt indicating memory usage exceeding a

physical memory usage threshold, said characterization of said real memory usage

including a memory state set according to an amount of physical memory used (the

compression management responding to the compression signal by generating a

compression signal effecting compressed storage of data within the memory) [Col. 2,

Line 65 to Col. 3, Line 3].

With respect to claims 3 and 18, Relph teaches said memory controller including one or

more threshold registers associated with a physical memory usage threshold, said

interrupt being generated when a usage threshold value is exceeded [Col. 8, Lines 48-

67; Col. 5, Lines 29-38].

With respect to claims 4 and 19, Relph teaches said device driver comprising a

mechanism responsive to said interrupt for adjusting said physical memory usage

threshold value in accordance with a current memory usage state [Col. 8, Lines 48-67;

Col. 5, Lines 29-38].

With respect to claim 6 and 21, Relph teaches said compressed memory device driver

comprising a mechanism responsive to said interrupt for broadcasting low physical

memory interrupts to client applications running on said computer system [Col. 8, Lines

48-67].

With respect to claims 15 and 28, Relph teaches managing said real memory usage

including memory usage information including memory compression statistics [Col. 8,

Lines 48-67].

With respect to claims 7-8 and 22-23, Relph teaches a memory threshold state

including <u>one</u> of a steady state warning state and emergency state, said memory

threshold programmable by a user, and said device driver including in interface for

enabling the user to set a memory usage threshold [Col. 6, Lines 13-34; Col. 8, Lines

48-67].

Allowable Subject Matter

5.   Claims 5, 9-14, 20, 24-27, and 29-30 are objected to as being dependent upon a

rejected base claim, but would be allowable if rewritten in independent form including all

of the limitations of the base claim and any intervening claims.

Conclusion

6.   The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure.

US 6516,397 (Roy et al) teaching virtual memory system utilizing data

compression implemented through a device.

7.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the mailing date of this final action.

8.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Pierre-Michel Bataille whose telephone number is (703)

305-0134. The examiner can normally be reached on Tue-Fri (7:30A to 6:00P).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew M. Kim can be reached on (703) 305-3821. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Pierre-Michel Bataille
Primary Examiner
Art Unit 2186

September 1, 2004